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Government Interventions in Agricultural Insurance

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Abstract

Agricultural insurance is normally undertaken as a market-based activity by private or state sector insurance companies, often with support measures from government. There is increased interest in risk management and insurance to promote agricultural investment and access to credit, and to provide financial stability to farmers and other actors in the agri value chain. The various types of intervention which are made by governments to facilitate agricultural insurance are reviewed, based on the results of a recent international survey conducted by World Bank. Whilst premium subsidy is the most common intervention, other enabling measures are important, such as the legal and regulatory framework, reinsurance, technical and administrative assistance, and linkages to government extension services in agriculture, animal health or meteorology. The main constraints and opportunities for crop and livestock insurance in developing countries are considered, such as insurance product types, hazards, vulnerability, and rural institutions which can support organisation and distribution. Developing appropriate distribution channels, and linking insurance to measures which can increase agricultural productivity, such as credit, farm inputs and services, provide an opportunity where insurance can add benefit to farmers. Insurance in isolation may attract little demand and may not be seen as a value proposition. Agricultural insurance is normally only affordable for exceptional events, and should not crowd out traditional risk coping at household or community levels, and can complement formal savings to manage frequent risk events. Agricultural insurance is complex from technical, organisational and financial standpoints, leading to many challenges for the insurance market and to decisions by government for appropriate intervention. This paper will consider international experiences in developing agricultural insurance, the governments' interventions and relate these to the rapid expansion of the Chinese agricultural insurance market.

Key words: Agricultural insurance, risk management, government intervention, subsidy, reinsurance, linkages.

1. Introduction

Agricultural insurance is a major global line of insurance business, with premiums estimated at US$20 billion in 2009. Agricultural insurance is most developed in high income countries, and is a highly challenging class of

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business, especially in low and middle income countries, where both rural and insurance infrastructure is poorly developed. Insurance companies which have been successful in servicing farmers and rural clients have specialised in terms of products, but also in linkages with other rural service providers for distribution. Agricultural risk management, of which insurance is only one part, has assumed a high profile as a result of pressures to increase food production, to develop agriculture and reduce poverty, as well as for climate change adaptation, where insurance is seen as having a role to play.

Unlike most lines of insurance, which are normally offered in the private sector and are market-based, agricultural insurance has attracted government intervention. Agricultural insurance has potential social, developmental, and poverty reduction benefits, as well as fulfilling a role of income stabilisation for farmers, financial protection against weather risks, and as a form of collateral to facilitate access to agricultural finance. The great difficulties of delivering viable market-based agricultural insurance, which deter the private sector in developing countries, have at the same time led governments to enter into various types of support for agricultural insurance. There are many parallels between government interventions in agricultural finance and in agricultural insurance.

A 2008 survey of 65 countries undertaken by The World Bank[1] has provided insight into the extent of agricultural insurance penetration, and the types of intervention taken by government in different countries. The findings of this study are particularly interesting for China, in view of the extremely rapid expansion of the agricultural insurance market, and strong intervention of central and provincial government in promoting insurance.

There is intense interest in index insurance, including amongst governments, donors and academics. Index insurance, either as parametric weather based index or area yield index insurance, is seen as overcoming some of the constraints inherent in traditional insurance, and particularly multiple peril (yield-based) crop insurance (MPCI). However, index insurance itself has many shortcomings, not least the difficulty of scaling up its expansion on a national scale, and its limitation to farming situations where individual weather perils (such as drought) are of over-riding importance.

2. Extent of global agricultural insurance

Agricultural insurance in *high income* countries is well, but not uniformly, developed. In the USA and Canada, private sector crop-hail insurance co-exists with government supported, multiple peril crop insurance, mostly underwritten by public-private sector insurers. In Europe, agricultural insurance is much more diverse: in Germany, private sector, unsubsidised insurance is widespread. In Spain and Italy, governments provide heavy subsidies and public-private partnerships have been developed. In France, government provides disaster cover but private insurers provide routine crop and livestock insurance. In Greece, agricultural insurance is provided in the public sector. 86.5% of global agricultural insurance premiums are derived from high income countries.

In contrast, only 6% and 7.4% of global agricultural insurance premiums are generated in *upper and lower middle income countries* respectively. Agricultural insurance premiums from *low income countries* are negligible at 0.03% of total.

Agricultural insurance premiums, expressed as a percentage of agricultural GDP, are nearly 8 times higher in north America than in Europe, followed by Oceania, Asia, Latin America and Africa. Agricultural insurance premiums are increasing rapidly, fuelled by increasing commodity prices, increasing attention to risk and climate change, and particularly because of increased government policy intervention into agricultural insurance.

Overall, agricultural insurance premiums have increased dramatically, from about $8 billion in 2004 to about US$20 billion in 2009. This is a result of increasing commodity prices, and therefore sums insured, strong growth particularly in China, Brazil and Eastern Europe, and increasing government financial subsidy support.

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[1] Mahul, O, & Stutley, C.J. (2010): "Government Support to Agricultural Insurance: Challenges and Options for Developing Countries". World Bank, Washington D.C. Available at http://publications.worldbank.org

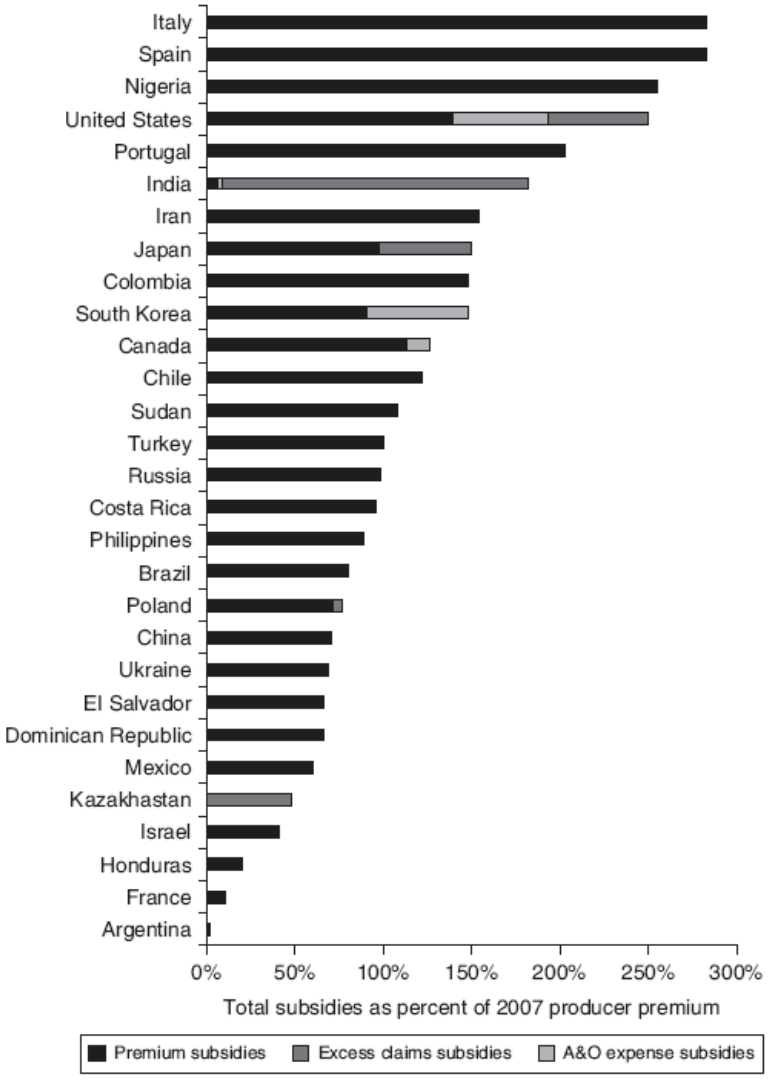
Although agricultural insurance is offered in about half of the countries of the world, penetration in most middle and lower income countries is very low, even where insurance is offered. *The extent to which agricultural insurance markets have developed is highly differentiated between countries*, and there is much variation in terms of organisational structure, private or public insurance, or in the extent and type of government interventions. There is considerable difference in products offered, and whether markets are voluntary or compulsory, or with semi-automatic enrolment due to linkage between farm credit and agricultural insurance.

3. Characteristics of agricultural insurance and government interventions

The 2008 World Bank survey showed some characteristics of agricultural insurance markets, and the extent of government intervention, and these are summarised below:

- Crop insurance is much more dominant globally than livestock insurance, accounting for 90% of agricultural insurance premiums.
- Public-private partnerships are prevalent in underwriting and delivering agricultural insurance, particularly in middle and low income countries. In such partnerships, agricultural insurance is the responsibility of private insurers, but with some government collaboration or assistance. They are typically the structure for delivering MPCI, which in all countries except South Africa is significantly subsidised by government. Experiments in public sector agricultural insurance in the 1970's and 1980's in Latin America were not successful (Hazell et al, 1986).
- The private insurance sector is important for named peril crop insurance, particularly in high income countries.
- Underwriting profitability is higher for private sector named peril insurance, than for multiple peril crop insurance.
- Government interventions take many forms, but the dominant financial mechanism is premium subsidy. However, financial support may be provided through administrative subsidy, or by direct provision of reinsurance or subsidising claims payments. After considering all government costs, farmers typically pay between 25% and 50% of the costs of insurance provision. The total public cost of agricultural insurance is estimated at 68% of global premium volume, of which upfront premium subsidies is estimated at 44% of original gross premiums. The public cost of all forms of agricultural insurance subsidies typically represents 50% to 150% of the premiums actually paid by farmers in the countries surveyed (Figure 1), although can reach 200% in some high income countries, for example USA, Spain and Italy.

Figure 1. Government subsidies as a percentage of 2007 premiums paid by producers in selected countries. (Source: World Bank survey, 2008)



Source: World Bank Survey 2008.
Note: The producer premium is the share of total premium paid by the farmer after deduction of premium subsidies. Excess claims subsidies in Kazakhstan are based on a three-year average for 2004–07. The figure for the United States excludes private crop hail insurance.

- Other forms of government support include provision of government personnel for loss adjustment, provision of legal framework (although only in 50% of the countries surveyed), or significant product development investment and regulatory frameworks in countries such as the USA and Canada.
- Delivery mechanisms include agents, financial institutions, producer associations and co-operatives. Programmes are generally voluntary but are often effectively compulsory, insurance being required by lenders as a condition for agricultural credit.
- Costs of administration, including business acquisition, overhead and loss assessment, are typically 25% to 30% of premium income. Costs are lower for named peril crop insurance, and highest for MPCI.
- Private sector reinsurers are the dominant providers in high income countries. Government may provide reinsurance or other risk funding.
- Index insurance is available or being piloted in 20% of the countries surveyed. Area-yield index insurance is the base of the Indian National Agricultural Insurance Scheme; parametric weather index insurance is relatively

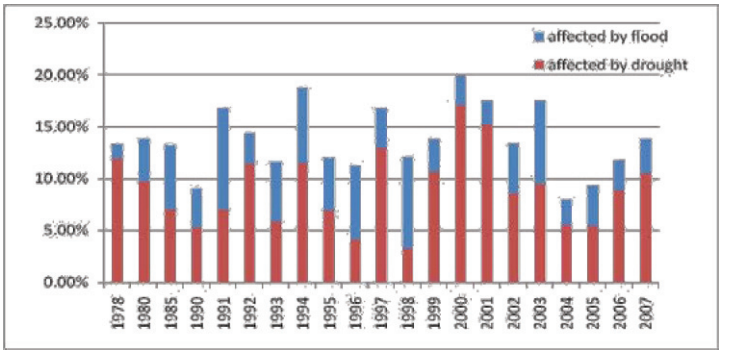
new but is attracting much interest and is being piloted in several countries. Global premium income from index insurance is very small compared to traditional agricultural insurance.

4. Some Challenges for Agricultural Insurance in China

- **Diversity of risks and agricultural production**

China is one of the countries in the world most prone to natural disasters. Drought, flood, hail and freeze are the main weather risks for China's agricultural production. Weather risks, particularly drought and flood, have significant adverse impacts on agricultural production. The data from the National Statistics Bureau indicate that from 1978 to 2007, 9% of the sown areas lost more than 30% of their yield due to drought and 5% of the sown areas lost more than 30% of yield due to flood. Figure 2 shows the percentage of the total sown land affected[2] by the drought and flood.

Figure 2. Percentage of land in China affected by flood and drought, 1987 to 2007.



Last year (2009) serious drought occurred during the spring in central and northern China, which affected about 15 million hectares of farmland (6% of total). The record level of grain production in China in 2009 could have been significantly higher were it not for drought.

As China is a large country, the aggregate data at national level masks regional differences. At province level, the deviation of the production would be much more significant. Recently a severe drought hit the South WestChina, leading to a heavy loss of crops in five provinces, namely Yunnan, Guizhou, Guangxi, Chongqing and Sichuan. Some counties within those provinces suffered total losses of early rice production.

- **Rate of insurance expansion**

1982 marked the re-start of the operation of agricultural insurance in China. The first 11 years (1982-1993) saw a rapid growth in this sector due to strong government support. At that time, agricultural insurance was not market oriented; rather, it was managed and controlled by the government. In the peak year of 1992, the premium volume from agricultural insurance was RMB 817 million RMB. (US$148 million[3]).

In the 1990's, Chinese insurance companies were commercialised. This process implied that the excess losses would no longer be borne by the government. Insurers had to control their risks and to pursue profitable business as commercial companies. The loss ratio, or the ratio of the claims paid to the premium collected was 109% for PICC before 1995, which was one of the two insurers involved in agricultural insurance business (Tuo Guozhu, &LiJun,

[2] According to the terminology of China's statistics, the **affected** areas mean the areas where the yield loss is equal to 30% or more.

[3] Exchange rate of RMB to USD in 1992: 1 USD=5.5149 RMB

2003). Commercial insurance companies could not offer agricultural insurance at these loss ratios, which led to the withdrawal of insurers from the agricultural insurance market. By 2003, the volume of agricultural insurance premiums was just one third of the 1992 peak.

The Chinese government has recognized the important role that agricultural insurance could play in protecting farmers' incomes and in providing incentives for agricultural production. Given the gap between urban and rural areas, the Chinese government has pledged to prioritise "agriculture, rural areas and farmers", and transfer resources to rural areas. Agricultural insurance subsidies were one of the measures to protect farmers' incomes.

In 2007, for the first time, the central government provided US$147 million for agricultural insurance premium subsidies; it grew to US$887 million in 2008, representing a five-fold increase. In 2009 the State Council clearly confirmed the objective to speed up the development of agricultural insurance, expand the pilot areas, increase the range and types of agricultural insurance products available as well as to increase the level of premium subsidies for the central and western regions of China.

Consistent with the rapid growth of premium subsidies, both for crop and livestock insurances, the agricultural insurance market continues its fast expansion. The premium volume for agricultural insurance was estimated at US$1.96 billion in 2009, ranking China as the second in the world. More than 100 million rural households were covered in 2009. The fast expansion of the market further increases the exposure of insurers to catastrophic losses.

The Chinese agricultural insurance market has been expanding dramatically since 2007, at a rate of increase much faster than those in USA and Spain, where the programmes have evolved over a long time period. The market in China provides a good coverage for the farmers. For instance, 10.32 million farmers, accounting for 13% of the total number insured[4], received payouts in 2008 after disasters happened. However, some questions are raised by the challenge facing China in responding to such a massive market expansion. Several issues are worthy of consideration as below:

1. The regulatory framework and institutional arrangements

China does not have an agricultural insurance law yet. There are some regulations and policies but it is far from sufficient for the development needs of the market. The institutional and financial arrangements, particularly for catastrophic response to crop losses or epidemic livestock disease, if not clearly planned, may impose a risk for the insurance market, and policyholders, to respond effectively to catastrophic disasters. The infrastructure including the human resources

The expanding market requires significant inputs of staff time and expertise. As the agricultural insurance markets shrank in the 1990's and early 2000's, the human resource reserves were reduced. Many departments of agricultural insurance research bodies closed due to limited demand and funding. PICC was the sole agricultural insurance company, but they did not train many staff because the business was shrinking. Therefore, the expertise shortage became a serious issue after the market expansion in 2007. Further, the new market-based orientation of agricultural insurance requires staff with a more business-like approach to insurance operations than previously.

2. Product pricing

Insurers are rushing to expand coverage but limited attention is paid to product pricing. This is understandable as the agricultural insurance scheme in China provides a social benefit transfer, and does not demonstrate pure market behavior. Insurers also hope to adjust the prices after some experience is developed. However, pricing which is not based on actuarial analysis may lead to an unpredictable risk for the insurers, and make access to the reinsurance market more difficult in the longer term.

[4] CIRC, National Insurance Working Meeting, Dec. 2008

- **Product type and loss adjustment**

MPCI is the dominant agricultural insurance product in China[5]. It was introduced to China in 1980's by PICC. The MPCI covers multiple perils including rainstorm, flood, waterlogging, strong wind, hail, frost, disease, pests, and rodents. Currently the MPCI provides cover for grains, fruit, vegetables, and other crops. Premiums of rice, wheat, corn, soybeans and rapeseeds are subsidized by the central government and the provincial governments. Other crops in some provinces are subsidized by provincial governments and county governments depending on their financial capacity.

The main challenges of MPCI, as well as many other insurance products, are moral hazard and adverse selection resulting from asymmetric information. Moral hazard happens if a policy holder knows his risk better than the insurer, which may lead to behavioral change. Adverse selection happens when the individual facing higher risks tends to buy the insurance more than those with lower risks.

The problems of moral hazard and adverse selection in China may not be as severe as the theory and practices in other countries indicate. The reason is that firstly, the insurances policies are sold as group insurance at village level or township level, which means all the village/county members will buy the same product. Therefore the possibility of adverse selection is much lower. Secondly, the sum insured at present is rather low, e.g. one third of the expected revenue, which implies that farmers still need to retain a considerable proportion of the risk. Therefore farmers are likely to adopt measures to mitigate the loss. However, it was reported that during 2009 drought in north east China, farmers preferred to wait for the loss adjustment and payout than incur higher costs for irrigation to mitigate the loss. Therefore, it is worthwhile to review the MPCI product and the scheme to reduce such difficulties.

Another challenge for MPCI, which is more significant in China, is loss adjustment. Field visits to assess the loss require specific expertise and staff time, which is extremely short supply. Loss adjustment represents a significant operational cost, which has to be factored into the premium. The challenge is especially relevant in China's case as farmers in China hold an average of just 0.168 hectares of land per capita. Furthermore, the tiny amount of land held by each farmer is often divided into separate plots dispersed across the village. The dispersal of the land in the villages accelerates the operational challenges of loss adjustment.

In practice, in order to simplify the loss adjustment process, some measures are implemented, such as sample assessment. A survey conducted in Anhui province found that the procedure was based on the claims reported by farmers in their loss reports, through the village committee or village head. The claim was then verified by choosing a number of villages per county to be assessed - a method which is not statistically robust. Many technical issues are critical to MPCI loss adjustment practicalities, such as the spatial distribution of damage, zoning of farmers into groups for assessment, the setting of appropriate insured yield level in relation to peril type, and technical procedures to measure loss in many different crop types.

In any country, the main challenges of MPCI centre on loss adjustment operations and procedures, and training for loss adjustment. Costs are also related to frequency of claims (number of claims per policies issued), the complexity of the assessment procedures, and many related factors. Thus crop loss adjustment and products pricing are two areas which can be identified as particularly challenging for future development of agricultural insurance in China.

- **Rural delivery of insurance**

The distribution channel is concentrated in the official local government approach. Insurers rely on the local authorities, e.g. village heads, township and county governments to distribute the product and help to assess the losses. This arrangement somehow reduces the effectiveness and efficiency of the insurance products, although the adoption of these channels has been necessary to achieve rapid expansion. International experience showed that organizations trusted by the farmers play an important role in distributing products, in training farmers, increasing

[5] A few small pilots of weather index insurance products have been tried in China, but the scale is negligible. There are also some named peril insurances such as the storm insurance for rubber and banana in Hainan province. But again, the scale is rather small and localised.

the awareness and meanwhile, enhancing their participation in the development of the insurance scheme to make the products better meet farmers' needs.

Grass root organizations including Rural Credit Cooperatives (RCC), the offices of Postal Savings Bank of China (PSBC) could act as the intermediaries for insurance distribution. The value to involve such organizations is also to increase the linkage and access to credit, which could have an impact on income generation.

- **Public interventions**

Government can play an important role in agricultural insurance development. Important public interventions include the provision of a regulatory and legal framework, targeting and clarification of market incentives, reduction of the transaction cost, investment in research and development, as well as minimization of the information asymmetries. Promotion of technical expertise and training in agricultural insurance, through provincial collaboration, centralized information and data systems, and international market-based and professional collaboration, can all contribute to the development of agricultural insurance.

However, the role of Chinese government in the agricultural insurance market is not well defined. It looks that governments are acting as the resource and subsidy provider, and sometimes as a reinsurer, as well as playing a pivotal operational role. Governments are engaged in the business operations, including the insurance distribution and loss adjustment. This overloads the work of the government staff. A challenge remains how to administer market-based agricultural insurance, and particularly MPCI, given the reliance in China on government channels.

5. Discussion

In almost all countries, governments have realised that agricultural insurance is an important instrument to help farmers manage financial impacts of production risks, principally those caused by weather or uncontrollable pest and disease. Rationale for government intervention includes the catastrophic nature of weather risk, and market failure to supply agricultural insurance. In high and some middle income countries such as the USA, Canada, Spain, Italy, Japan and South Korea, governments have intervened heavily, created sophisticated market structures, and accepted that significant annual budgets should be allocated to agricultural insurance. In other countries, including Germany, Australia, New Zealand, South Africa and Argentina, limited support is provided and the private market has been entrepreneurial and competitive in expanding the marketplace. Even where public private partnerships prevail, there is a realisation that insurance is best implemented using sound insurance market-based business principles, as practiced in the private sector.

One argument for government policy intervention is to promote better and more targeted compensation of losses, as insurance can provide *ex ante,* a contractual basis, and a technical approach, to measuring and valuing loss. The argument is that governments could phase down *ad hoc*, *ex post*, disaster compensation for agricultural losses. In reality this has often not been achieved, due to the political imperative to intervene to help farmers in emergency situations. The USA is one example (Glauber, 2007). In developing countries, disaster relief and social insurance is likely to continue to play an important role, but planning of agricultural insurance, disaster risk reduction and management, and wider agricultural risk management, can allow a more structured and planned mechanism to anticipate and deal with agricultural loss.

The difficulties of reaching large numbers of small farmers, and adjusting losses in the field, are massive or infeasible in countries where insurers have limited rural networks. MPCI has failed in many developing countries, and the difficulties of MPCI are well documented (e.g. Hazell, 1992). Farmers are able to alter behaviour in order to influence insurance outcomes under yield-based coverage, especially individual-farmer coverage, although we suggest that this may not be so significant in China, where farmers are insured through collective policies at township level. Loss adjustment objectivity and transparency is extremely difficult where individual farmer losses must be assessed. However, individual farmer MPCI, in small farmer communities such as in China, leaves massive challenges in terms of loss adjustment, transparency and trust between insurers and farmers, and sometimes government. MPCI is highly dependent on technical methodology for loss adjustment of different crop types, with strong implications for technical staff, training of staff, and overall costs of administration. In communities of small

farmers, the reality is that area-based loss adjustment, linked to zoning of damage, needs to be developed, rather than individual farmer insurance.

The interest in index insurance is built on the premise that it offers a more transparent and objective basis for insurance of weather risks. However, experience shows that index insurance carries its own challenges, mainly in the narrower scope of its cover to specific weather perils, and difficulties of scaling up; as a recent innovation, markets are not mature. In spite of its difficulties, MPCI does offer an advantage that it is standardised, and theoretically can be scaled up more rapidly in terms of sales, but challenges of managing losses remains a main impediment. MPCI is attractive to governments in that all causes of loss are covered, and this is also more attractive as a form of collateral to providers of agricultural credit. Both area yield index and weather index insurance have a role where there is a strong and widespread correlation of weather events and losses. They also offer potential for application as micro level (farmer) insurance, or at a meso level to processors and aggregators in the agri supply chain, or to municipal level authorities. However, in spite of the attention to index insurance in the development community, MPCI is likely to remain highly dominant globally for the foreseeable future, and efforts to overcome some constraints in MPCI should not be neglected.

In China, all these issues are highly relevant, due to the high rate of expansion of MPCI promoted by government, with strong social and developmental objectives, but delivered as market-based insurance through public private partnerships at provincial level. Several key challenges for China are highlighted in this paper, centred on effective local product delivery and on loss adjustment organisation, given small average farm size. Lessons from International experience in government support for agricultural insurance, and particularly of MPCI, should contribute to the review of technical and organisational constraints, and opportunities, for China.

Increasing pressures including climate change adaptation, food security needs, and the role of insurance to collateralise lending needed for agricultural productivity, means that agricultural insurance will remain high on the agenda for rural development and risk management in every country.

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